



**WASHINGTON COUNTY
ENGINEERING AND DEVELOPMENT SERVICES**

Environmental Health Division

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**Septic System Problems
Likely Causes, Possible Solutions, and Preventing Failure**

Septic system malfunctions and failure can result in sewage backup into the home/business, untreated or inadequately treated sewage emerging at the ground surface or being sprayed on the ground, and leaching of sewage to groundwater. These conditions can, and often do, pose health risks; since persons may come into contact with this sewage discharge and nearby water wells and surface water may become contaminated.

Failure of a septic system can occur for several reasons: inadequate design, faulty installation, and improper use and maintenance.

Design Failures:

- The significance of the Site Evaluation should not be underestimated. The soil class indicates how much water the soil can absorb over time. The groundwater evaluation determines the depth to seasonal groundwater. Other factors that must be considered are gravel content, restrictive horizons, surface drainage, and potential flooding.
- Underestimating water usage when designing a system and systems installed in a poor soil drainage area will usually experience the most common malfunction, hydraulic overload. There are several possible reasons for the overload. If actual water usage is greater than the designed water usage rate or if the soil analysis was done incorrectly, the system may be undersized. So, while water continues to be used at the higher rate, the undersized system is unable to handle the additional hydraulic loading, becomes stressed, and fails. However, the overload may not always result from water use. If seasonal groundwater, surface drainage, or potential flooding were not appropriately defined, water may flow into the system causing seasonal failure.
- Additionally, inadequate design of systems located in the floodplain may result in damage to the tanks or other system components.
- Another design failure may occur if the septic tank is undersized. If not pumped frequently, an undersized tank will allow solids to reach the disposal system, clogging the lines and resulting in system failure.

Installation Failures:

- Poor installation practices can also lead to system failure. Drainfield lines unequally distributed, not level, or placed on a steep grade without steps, will cause overload to parts of the disposal system.
- Heavy equipment or damage to the fieldlines during installation can result in soil compaction and consequently reduce the soil percolation rate, particularly when the soil moisture content is high.

- If surface drainage is not diverted away from the disposal system it will naturally flow onto it, which can lead to hydraulic overload.
- Additionally, if non-buried components of a system located in the floodplain are not elevated above the Base Flood Elevation, floodwaters can cause hydraulic overload as well as causing other damage to the system.

Use and Maintenance Failures:

- No septic system is designed to be maintenance-free. Even a correctly designed and installed system will not function as it should without proper maintenance. Neglecting system maintenance leads to system failure.
- Probably the most effective way to prevent system failure is water conservation.
- What is your current water usage rate, is it more than the designed amount due to a change in the number of occupants, hours of use per day, a large amount of clothes washing or food preparation, or expanded business activity? Systems are designed based on estimated water usage in gallons per day; usage above the designed amount can cause system failure.
- Are there any leaking plumbing fixtures? Even a small leak can cause system failure over a short period of time. Not all leaks are apparent. To check toilets for leaks, add a few drops of food coloring to the toilet tank. Do not flush. If the color appears in the toilet bowl within a few minutes, there is a leak that needs repair.
- Do not install an irrigation system or water excessively in the disposal area. This additional water may hydraulically overload the disposal system, and even a small leak in a nearby underground water pipe could allow wastewater to contaminate your drinking water.
- Septic systems process and treat wastewater as it enters the system. To help prevent hydraulically overloading the system water use should be spread out as much as possible. Laundry, dishes, and cleaning should be done throughout the week, not all on one day. High water usage over short periods of time does not allow time for the system to adequately process and treat wastes, and may also cause passing of solids into the disposal system. Excessive use of cleaners and detergents, especially those containing bleach or with high phosphate content, can affect the proper function of the system. Low inert (clay) content detergents are recommended, and fabric softener sheets over liquid softeners. Bleach should be used sparingly, and at half the rate indicated on the container.
- Whenever possible, wash clothes and run the dishwasher only with a full load.
- Avoid running water continuously when brushing teeth, washing hands, preparing food, or washing kitchen utensils.
- Insulate all hot water pipes to reduce running of faucets until the water turns hot.
- Avoid taking long showers, or reduce the level of water in the bathtub.
- Install water saving devices in faucets and showers.
- Reduce the amount of water used for flushing toilets by installing a new low-flow toilet; or by adjusting the float to reduce the water level in the tank; or by filling a plastic bottle with water and putting it into the tank to displace some of the water.
- Is there a calcium problem with the water supply?
- Backwash from water treatment equipment such as water softeners and reverse osmosis systems that is discharged into a septic system can at least disrupt proper wastewater treatment, and may likely cause hydraulic overload if not properly installed. All such discharges must enter the septic system through an airgap device. See §285.37 for criteria on using water treatment equipment with a septic system.

- Water from hot tubs, whirlpools, a/c discharges and other condensation, storm drains, gutters, house footing drains, and sump pumps should not be discharged into a septic system, but should be diverted away from the septic system to allow the system to work properly. Emptying large quantities of water into the septic system can overload it and stir the solids in the tank, pushing them into the disposal system and causing failure.
- All water discharged to a septic system must be taken into account when planning the system. Systems are designed based on the estimated usage in gallons per day and on the estimated wastewater strength, water usage above the designed amount and increases in wastewater strength can cause system failure.
- Is the system sealed properly? Cracked or broken tanks, risers, inspection ports, or cleanouts allow stormwater to enter the system and can cause system failure.
- Are all inlet and outlet baffles in good condition? Without the baffles, scum, solids, and sludge can enter and clog the disposal system.
- Is graywater currently being discharged into the septic system? If so, diverting the graywater to discharge outside of the septic system may allow it to work properly again, if site conditions will allow for graywater disposal. See §285.80-81 for criteria on disposal of graywater.
- Are trees or shrubs planted over or near the disposal system? Roots from nearby trees or shrubs can clog and damage fieldlines. Trees, shrubs, tall grass, or anything else within the spray disposal area interferes with the uniform application of effluent. Large shade trees can block sunlight, causing the system not to work properly.
- A dense grass cover should be planted, not sodded, in the disposal area for absorption and to prevent erosion. Overseed the disposal area with winter grasses or evergreen ground cover for absorption and erosion prevention during dormant growing seasons.
- Keep grass mowed to allow sunlight to reach the ground surface.
- Settling of backfill will occur over time. Periodically check for this and fill any low areas with Class II or III soil to prevent water from ponding in the disposal area, which can overload the system.
- Don't construct anything over your disposal system. Buildings and surfaces such as concrete, asphalt, or gravel prevent the disposal system from working properly.
- How long has it been since the tanks were last pumped-out? Scum and sludge buildup inside the tanks can cause system failure. Generally, if the scum layer is within 3 inches of the bottom of the inlet baffle, or if the sludge depth is one third or more of the liquid depth, the tank should be pumped. If it is not practical for you to inspect your tanks, set up a regular schedule with a service company to have them pumped about every 3 years.
- Has the wastewater strength changed from the design value? This can be caused by current conditions that did not exist when the system was designed, such as using a residential system for a commercial kitchen, a change in business activity or type of business, occupants using harsh cleaners or disposing of chemicals in the wastewater, and occupants that are taking chemotherapy or other medications. Harsh chemicals, including automatic disinfection tablets, can kill the beneficial bacteria that treat the wastewater. Systems are designed based on the estimated wastewater strength; increases in wastewater strength can cause system failure.
- Avoid excessive use of a garbage disposal. Garbage disposals can overload a system with solids causing the need for more frequent tank pumping; and can increase wastewater strength beyond the capacity of the system to properly treat it.
- A septic system should not be treated as if it were a city sewer system, don't use your toilet as a trash can. Do not flush plastic, rubber, coffee grounds, citrus rinds, egg shells, dental floss, diapers, baby wipes, kitty litter, personal sanitary products, cigarette butts, expired medications, bandages, hair, cotton, lint, rags, fats, greases, paper, paints,

solvents, varnishes, thinners, waste oils and automotive fluids, photographic solutions, pesticides, herbicides, or fertilizers down into your septic system. Moderate use of household cleaners will seldom affect the system, but only a small amount of drain cleaner can kill beneficial bacteria and disrupt the system. Installing a filter in the septic tank second compartment outlet may also help.

- The usefulness of septic tank additives, so-called enzymes, and system cleaners is highly debated, but most believe these are not necessary for proper operation under normal conditions and some may even be harmful to your system. Read the label before use.
- If the system has a pump, is the pump elevated above the sludge on the tank bottom? Installing a 100 micron effluent filter should also be considered.
- If the system requires chlorine tablets, are the correct ones being used? Calcium Hypochlorite tablets must be used for wastewater disinfection; they are very reactive and quickly kill the bacteria present in wastewater while the chlorine residual dissipates rapidly to reduce damage to the receiving environment. The other type of chlorine tablet, which must not be used for wastewater disinfection, is chlorinated isocyanurates, which are usually referred to as “swimming pool chlorine” or “tri-chlors”. These tablets dissolve too slowly to thoroughly disinfect wastewater; and create a chlorine residual that remains for long periods of time to damage the receiving environment.
- It may be necessary to expose several portions of the fieldlines to check for grease and biological matting. These conditions will not allow the drainfield to work properly. One possible method to consider that may allow the system to work again is to pump all the tanks and install an aerator. This option should be discussed with a sanitarian or engineer.

Unfortunately, installing a septic system according to Code does not guarantee that it will work properly, nor for how long, given the long list of variables that affect it. Installing a system according to Code is not a representation or warranty by the Texas Commission on Environmental Quality or Washington County of the suitability of a system, nor does it constitute any guarantee that the appropriate system was installed.

If simple corrective measures do not resolve a problem, and the system continues to malfunction, we recommend contacting a licensed installer, a registered sanitarian, or a professional engineer, to evaluate the system, investigate the cause of the malfunction, and recommend possible solutions.

Contact this office before making modifications to the structure, size, or system components, as a permit is required for each new, altered, repaired, or enlarged on-site sewage facility, whether the work is to be performed by the resident property owner or a licensed installer, and regardless of acreage, except that emergency repairs meeting the requirements of §285.35, and system maintenance do not require a permit.

Please feel free to contact us if you have additional questions or need further assistance.

This information is provided as a public service and is not an endorsement. Any person properly licensed in Texas, and any product approved for use in Texas, may be used.